Amendments to the Claims

Please amend claims 7 and 8 as indicated below. A listing of the pending claims follows. This listing of claims replaces all prior versions, and listings of claims in the application.

Listing of Claims:

1. (Previously Presented)A method for decoding transmitted data that has been generated by encoding a sequence of information data with a convolutional encoder that generates convolutional codes based on an input sequence of information data, the encoder characterized by a constraint length K and a data rate k/n, wherein K, k and n are integers the method employing a decoder ~~with a~~ memory, the method comprising the steps of:

(a) storing a first encoder state corresponding to a first time step;

(b) beginning at the first time step, performing a first traceback through a plurality of time steps, thereby determining a first input bit corresponding to an encoder state transition from the last time step of the first traceback to the second to last time step of the first traceback;

(c) storing in the decoder memory a first possible input data bit corresponding to a transition from an encoder state at a third time step within the first traceback, to an encoder state at a fourth time step within the first traceback, where neither the third nor fourth time steps are the last time step;

(d) performing a second traceback beginning at a second time step and encompassing the first time step, thereby determining a second encoder state at the first time step;

(e) comparing the first encoder state with the second encoder state; and

(f) if the first encoder state is equal to the second encoder state, designating the first possible input data bit as a decoded data bit corresponding to the transition from the encoder state at the third time step to the encoder state at the fourth time step.

2. (Original) The method of claim 1 wherein the second time step is the next time step after the first time step.

3. (Original) The method of claim 1 wherein the third time step is the next time step after the ~~last~~ second time step.

4. (Original) The method of claim 1 wherein the second traceback ends at the first time step.

5. (Original) The method of claim 1 wherein the second traceback traces back through one time step.

6. (Previously Presented) The method of claim 1 further comprising the steps of storing in the decoder memory, for each transition within the first traceback, a possible input data bit corresponding to the transition, thereby storing a plurality of possible input data bits in addition to the first possible input data bit.

7. (Amended) A digital communications system including a decoder for decoding transmitted data that has been generated by encoding a sequence of information data with a convolutional encoder that generates convolutional codes based on an input sequence of information data, the encoder characterized by a constraint length K and a data rate k/n, wherein K, k and n are integers the decoder comprising:

(a) a decoder memory;

(b) first storage means for storing a first encoder state corresponding to a first time step;

(c) traceback means for performing a first traceback through a plurality of time steps beginning at the first time step, to determine a first input bit corresponding to an encoder state transition from a last time step of the first traceback to a second to last time step of the first traceback;

(d) second storage means for storing in the decoder memory a first possible input data bit corresponding to a transition from an encoder state at a third time step within the first traceback, to an encoder state at a fourth time step within the first traceback, where neither the third nor fourth time steps are the last time step;

(e) partial traceback means for performing a second traceback beginning at a second time step and encompassing the first time step to determine a second encoder state at the first time step;

(f) comparing means for comparing the first encoder state with the second encoder state; and

(g) means for designating the first possible input data bit as a decoded data bit corresponding to a transition from the encoder state at the third time step to the encoder state at the fourth time step, if the first encoder state is equal to the second encoder state.

8. (Amended) The digital communications system including a decoder as in claim 7, further comprising third storage means for storing in the decoder memory a plurality of further possible input data bits, each corresponding to a transition in the first traceback.

9. (Previously Presented) A method for decoding transmitted data that has been generated by encoding a sequence of information data with a convolutional encoder that generates convolutional codes based on an input sequence of information data, the encoder characterized by a constraint length K and a data rate k/n, wherein K, k and n are integers, the method employing a decoder ~~with a~~ memory, the method comprising the steps of:

(a) storing a first encoder state corresponding to a first time step;

(b) beginning at the first time step, performing a traceback through a plurality of L time steps, wherein L is an integer;

(c) storing in the decoder memory a plurality of L-1 data bits corresponding to transitions between adjacent time steps within the traceback;

(d) performing a partial traceback beginning at a second time step, encompassing the first time step, and through less than all of said plurality of L time steps, thereby determining a second encoder state at the first time step;

(e) comparing the first encoder state with the second encoder state; and

(f) if the first encoder state is equal to the second encoder state, storing the L-1 data bits as valid data bits.

10. (Previously Presented) The method of claim 9, wherein said storing in the decoder memory ~~a~~ the plurality of L-1 data bits includes storing a first possible input data bit corresponding to a transition between an encoder state at a second time step within the traceback, to an encoder state at a third time step within the traceback, neither the second nor third time steps being the last time step of the traceback, and said storing the plurality of L-1 data bits as valid data bits includes designating the first possible input data bit as a decoded data bit.